

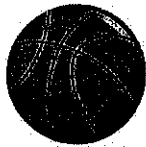
Prob and Stats PRACTICE Final Exam - Tri 3 - 2015 - Wiltsie**Multiple Choice***Identify the choice that best completes the statement or answers the question.***B**

1. Which events described below are independent?
- choosing 3 numbers in a bingo game
 - tossing 3 dice at one time
 - awarding first, second, and third prize
 - choosing two cans of juice from the fridge

A

2. The table shows the number of turnovers committed by the Fairfield High School basketball team during their first 8 games. Which of the following measures would make the team's average number of turnovers per game appear the lowest?

| | |
|----|----|
| 9 | 14 |
| 10 | 6 |
| 16 | 15 |
| 7 | 7 |



6, 7, 7, 9, 10, 14, 15, 16

- a. mode **7** b. range c. median **9.5** d. mean **10.5**

C

3. The performance review scores for several employees in a work group are shown in the table. Which of the following measures would make the average score appear as high as possible?

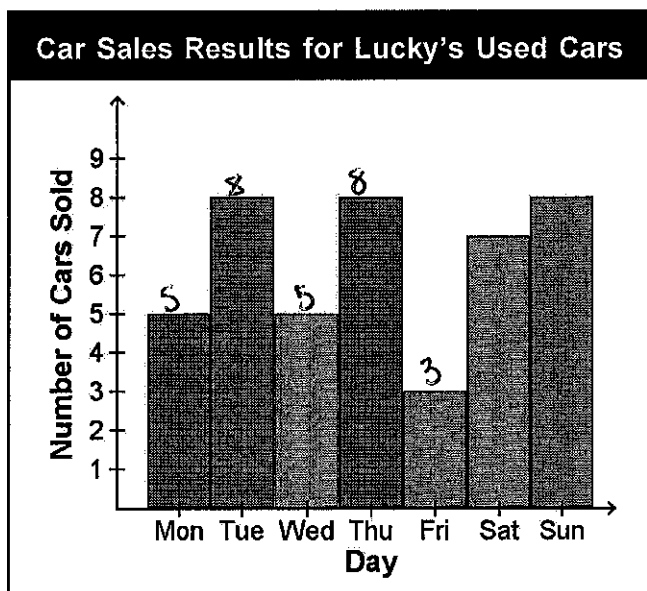
| Employee I.D. Number | Performance Review Score |
|----------------------|--------------------------|
| 101 | 78 |
| 102 | 91 |
| 103 | 83 |
| 104 | 76 |
| 105 | 88 |
| 106 | 72 |
| 107 | 80 |
| 108 | 83 |

72, 76, 78, 80, 83, 83, 88, 91

- a. range b. mean **81.375** c. mode **83** d. median **81.5**

Numeric Response

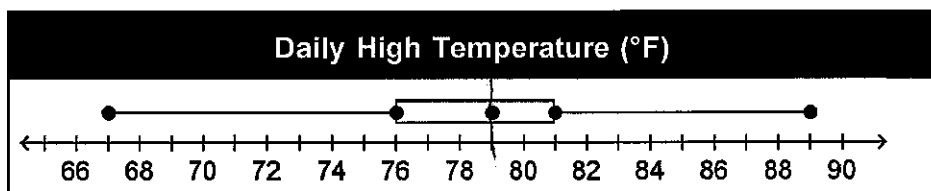
4. The graph below displays the number of cars sold each day for a given week at Lucky's Used Cars.



29 cars

How many cars had been sold through Friday?

5. Students in Mrs. Oswald's physical science class recorded the daily high temperature for 1 month in Miami, Florida. The data are recorded in the box-and-whisker plot below. What percent of the days had a high temperature of at least 79°F? Express your answer as a whole number percent.

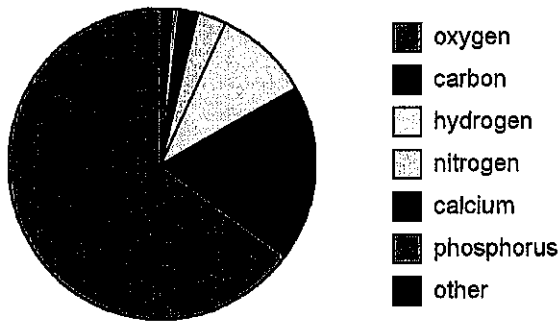


50%

Name: _____

ID: P

6. The human body is composed of many different chemical elements, as shown in the circle graph below.



What percent of the human body is made up of phosphorous?

1%

7. On a vocabulary test, Ken earned a score of 230 points out of a possible score of 250. What percent did he earn on the test?

92%

Short Answer

8. A factory manufactures plastic bottles of 3 different sizes, 7 different colors, and 3 different shapes. How many different combinations are possible?

$$3 \cdot 7 \cdot 3 = 63$$

9. David's science quiz has 7 multiple-choice questions. For each question, there are 5 possible answer choices. How many different choices for answering the 10 questions are possible?

$$5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 5^7 = 78,125$$

10. Tina has to create a password for the security of a software program file. She wants to use a password with 4 numbers (from 0-9). How many passwords are allowed if no numbers are repeated?

$$10 \cdot 9 \cdot 8 \cdot 7 = 5040$$

11. A box contains 5 videotapes and 12 DVDs. In how many ways can one videotape and one DVD be selected?

$$\frac{5}{17} \cdot \frac{12}{16} = \frac{60}{272} = \frac{15}{68} \quad \left[\text{or } \frac{5C_1 \cdot 12C_1}{17C_2} \right]$$

Susie has moved to a new apartment. Her kitchen dishes got mixed up in different boxes. One box has 10 cups, 5 plates, and 5 bowls. If Susie opens the box and picks 3 dishes at random, find the given probability.

12. $P(3 \text{ cups}) = \frac{10C_3}{20C_3} = \frac{120}{1140} = \boxed{\frac{2}{19}}$

13. $P(1 \text{ cup and 2 plates}) = \frac{10C_1 \cdot 5C_2}{20C_3} = \frac{10 \cdot 10}{1140} = \frac{100}{1140} = \boxed{\frac{5}{57}}$

Find the odds given the probability or find the probability given the odds.

14. $\frac{2}{35}$ 2:33

15. 3:7 $\frac{3}{10}$

16. A fruit basket contains 5 apples and 4 oranges. Sarah randomly selects one, **puts it back**, and then randomly selects another. What is the probability that both selections were oranges?

$$\frac{4}{9} \cdot \frac{4}{9} = \frac{16}{81}$$

17. A box contains 5 nuts, 9 bolts, and 3 screws. If 3 objects are selected in succession randomly, what is the probability of selecting a nut, then a bolt, then a screw, **if replacement occurs** each time?

$$\frac{5}{17} \cdot \frac{9}{17} \cdot \frac{3}{17} = \frac{135}{4913}$$

18. What is the probability of getting a 2 each time if a die is rolled 4 times?

$$\frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} \cdot \frac{1}{6} = \left(\frac{1}{6}\right)^4 = \frac{1}{1296}$$

19. The table shows the heights (in centimeters) of students of class IX.

| | | | | | | | | | | |
|-----|-----|-------|-------|-----|-----|-------|-----|-----|-------|-----|
| 138 | 152 | 163.7 | 145.2 | 160 | 165 | 159.3 | 175 | 175 | 172.4 | 180 |
|-----|-----|-------|-------|-----|-----|-------|-----|-----|-------|-----|

Find the mean, median, and mode of the heights to the nearest tenth.

$$\bar{x} = 162.33 \quad \text{med} = 163.7 \quad \text{mode} = 175$$

20. The table shows the difference between the actual and the estimated production of a home product (in percentage) by a company for the last seven years.

| Year | Difference in Production (percent) |
|------|------------------------------------|
| 1997 | 3.7 |
| 1998 | 5.1 |
| 1999 | 4.2 |
| 2000 | 4.7 |
| 2001 | 4.2 |
| 2002 | 2.8 |
| 2003 | 3.5 |

Find the mean, median, and mode of the percentage difference in production.

$$\bar{x} = 4.03 \quad \text{med} = 4.2 \quad \text{mode} = 4.2$$

Determine whether the given event is mutually exclusive or inclusive. Then find the probability.

21. A card is drawn from a standard deck of cards.

$P(\text{heart or diamond})$

Mutually exclusive

$$\frac{26}{52} = \frac{1}{2}$$

22. A card is drawn from a standard deck

 $P(\text{spade or face card})$

J.G.V. spades
↓

$$\text{inclusive, } \frac{13}{52} + \frac{12}{52} - \frac{3}{52} = \frac{22}{52} = \boxed{\frac{11}{26}}$$

A dice is rolled. What is the probability of rolling the following?

23. a 4 or a multiple of 3

$$\frac{1}{6} + \frac{2}{6} = \frac{3}{6} = \boxed{\frac{1}{2}}$$

24. A bag contains 8 pencils, 9 pens, and 3 highlighters. Ronald takes out one writing object from this bag to note down some important information. What is the probability that a pen or a pencil is selected?

$$\frac{9+8}{20} = \boxed{\frac{17}{20}}$$

Determine whether the given event is independent or dependent. Then find the probability.

25. Troy has seven \$1, five \$2, and three \$3 gift certificates. If he selects three bills in succession, what is the probability that a \$1 gift certificate is selected, then a \$3 gift certificate and then a \$2 gift certificate if replacement does not take place?

dependent

$$\frac{7}{15} \cdot \frac{3}{14} \cdot \frac{5}{13} = \frac{105}{2730} = \boxed{\frac{1}{26}}$$

The measurement of the height of 600 students of a college is normally distributed with a mean of 165 centimeters and a standard deviation of 5 centimeters.

26. What percent of students are between 160 cm and 170 cm in height?

68%

27. What percent of students are between 175 cm and 180 cm in height?

2%

28. What percent of students are less than 155 cm in height?

2.5%

29. What percent of students are taller than 170 cm?

16%

Find the variance and standard deviation of the given set of data to the nearest tenth.

30. {450, 170, 220, 470, 120, 570, 740}
- $\sigma = 212.161$
- Variance =
- $\sigma^2 = 45,012.29$

31. How many ways can 7 people be seated in 7 seats?

$$7P_7 = 5040$$

32. Find the number of different ways the letters of the word MARSH can be arranged if the first letter must be M.

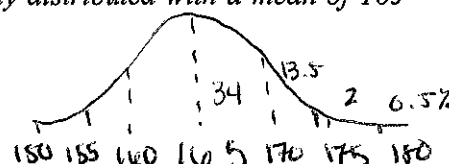
$$1 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 24 \text{ ways}$$

33. In how many different ways can 9 cars arrive at a fast-food restaurant's drive-up window?

$$9P_9 = 362,880$$

34. How many committees of 4 people can be chosen from a group of 10 people?

$$10C_4 = 210$$



35. A box contains 5 red marbles, 5 blue marbles, and 7 green marbles. What is the probability that a marble selected at random will be a green marble?

$$\frac{7}{17}$$

36. Two coins are tossed. Find the probability that one coin is a head and the other is a tail.

$$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

37. From a standard deck of 52 cards, 2 cards are selected without replacement. What is the probability that both cards selected are queens?

$$\frac{{}^4C_2}{{}^{52}C_2} = \frac{6}{1326} = \frac{1}{221}$$

38. Find the mean and mode of the data shown in the frequency distribution below.

| Weight (lb) | Frequency |
|-------------|-----------|
| 1 | 65 |
| 2 | 20 |
| 3 | 7 |
| 4 | 3 |
| 5 | 5 |

Mode = 1 Mean = $\frac{1(65) + 2(20) + 3(7) + 4(3) + 5(5)}{65 + 20 + 7 + 3 + 5}$

$$= \frac{163}{100} = 1.63$$

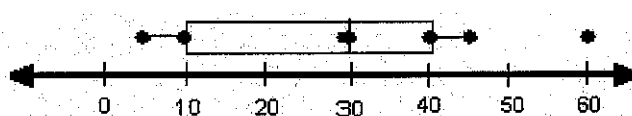
39. Find the mean of the data shown in the stem-and-leaf plot below.

| stem | leaf |
|------|-----------|
| 4 | 0 1 2 6 |
| 5 | 3 3 7 8 8 |
| 6 | 1 4 9 9 |
| 7 | 5 |
| 8 | 2 |

$$\frac{808}{15} = 53.87$$

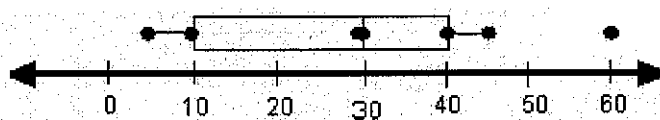
$$4|0 = 40$$

40. Find the range of the data shown on the box-and-whisker plot below.



$$60 - 5 = 55$$

41. Find the median of the data shown on the box-and-whisker plot below.

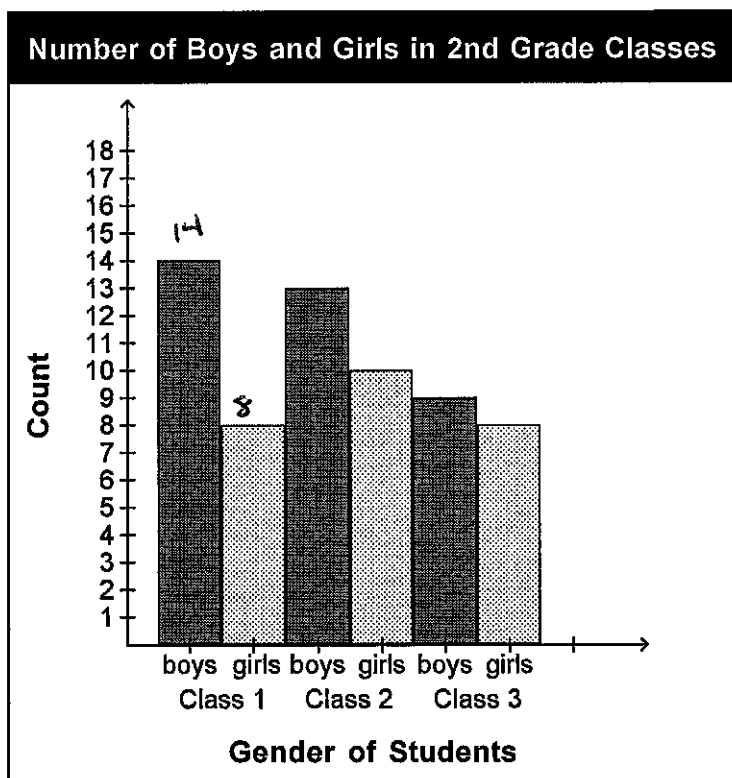


$$30$$

Name: _____

ID: P

42. There are three 2nd grade classes at Southgate Elementary School. The graph below shows the number of boys and girls in each of the three classrooms.



$$14 - 8 = 6$$

How many more boys are there than girls in the 1st grade at Southgate Elementary School?

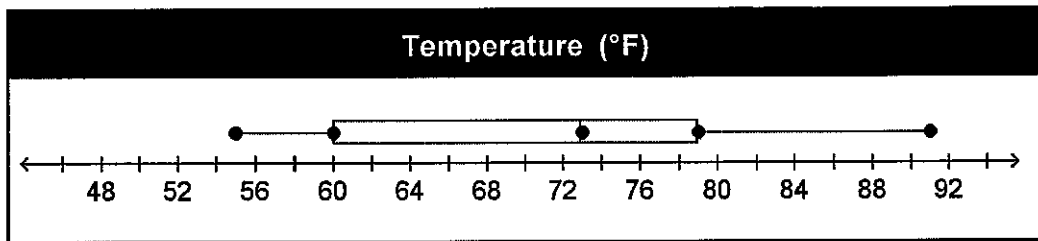
The stem-and-leaf plot shows the test scores on a midterm exam.

| Test Scores | |
|-------------|---------------|
| Stem | Leaves |
| 4 | 0, 1 |
| 5 | 0, 0, 5 |
| 6 | 2, 3 |
| 7 | 1, 3, 5, 8, 9 |
| 8 | 2, 7, 7, 8 |
| 9 | 5, 8, 8 |
| 9 8 = 98 | |

43. Refer to the above stem-and-leaf plot of test scores. How many students had a score in the forties?
- 2
44. Refer to the above stem-and-leaf plot of test scores. What was the highest grade earned on the test?

98

45. The high temperatures in several cities yesterday were recorded and organized in the box-and-whisker plot below. According to the plot, what was the highest temperature recorded?



91

46. Toothpaste company A surveys 400 randomly selected people to compare the taste of its new toothpaste to the toothpaste of its competitor, company B. The results of the survey are shown below. Based on these results, toothpaste company A then claimed: "People clearly prefer the taste of toothpaste A." Explain why this claim is misleading.

| Which brand's taste do you prefer? | |
|------------------------------------|-----|
| Brand A | 194 |
| Brand B | 182 |
| No Opinion | 24 |

There is not a significant difference between the # of people that chose A and B. B and no opinion put together are more than those who prefer brand A.

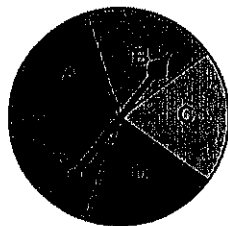
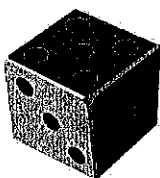
A research company surveyed 92 people at a local county park last weekend and asked if they planned to vote for a tax levy to support county parks. Of those surveyed, 64 said that they plan to vote for the levy.



47. Refer to the information above. Explain why the results of the survey might be biased.

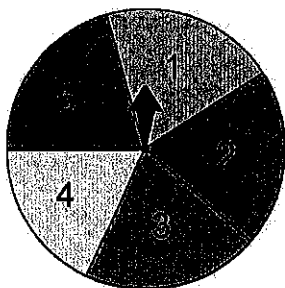
They only asked people at the park if they support the park.

48. Suppose a number cube labeled from 1 to 6 is rolled and the spinner below is spun one time. What is the probability of rolling a number less than 4 and spinning a consonant?



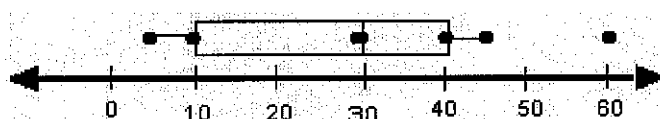
$$\frac{3}{6} \cdot \frac{3}{5} = \frac{9}{30} = \boxed{\frac{3}{10}}$$

49. Suppose a fair coin is tossed and the spinner below is spun one time. What is the probability of flipping heads and spinning a 2?



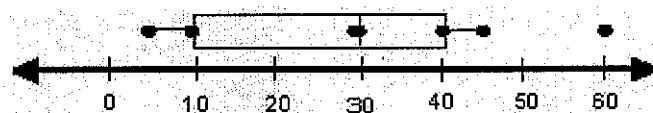
$$\frac{1}{2} \cdot \frac{1}{5} = \frac{1}{10}$$

50. What percent of the data shown in the box-and-whisker plot below is less than 40?



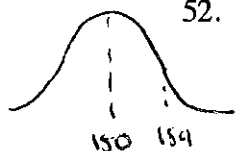
75%

51. What percent of the data shown in the box-and-whisker plot below is between 30 and 40?



25%

52. The heights of a certain group of adult females was found to be normally distributed. The mean height is 150 cm with a standard deviation of 4 cm. In a group of 1200 of these females, about how many would be more than 154 cm tall?



53. The mean of five numbers is 8. The five numbers are 12, 3, 7, 10, and x. Find x.

$$\frac{12 + 3 + 7 + 10 + x}{5} = 8$$

$$32 + x = 40$$

$$\boxed{x = 8}$$